

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): A variable-order delta sigma modulator comprising means that vary a combination of plural integrators constituting a delta sigma modulator to thereby vary an order of the delta sigma modulator, wherein the means vary the order of the delta sigma modulator into an optimum order in relation to a sampling frequency.

2. (currently amended): A variable-order delta sigma modulator comprising:
a plurality of integrators arranged in sequence to have ~~having~~ a construction that supplies quantization-errors from one said plurality of integrators to at least one integrator of a next-stage integrators,

~~comprising:~~ means of disconnecting or connecting circuits, provided in connection parts to supply the quantization errors to the next stage integrators, and

means of controlling the disconnecting or connecting means on the basis of a detected sampling frequency, whereby an order of the modulator is made variable in relation to the detected sampling frequency.

3. (original): A variable-order delta sigma modulator as claimed in Claim 1 or Claim 2, comprising a control means that switches the order of the modulator into an order optimum to a new sampling frequency, accompanied with the switching of the sampling frequency, on the basis of a table showing connections or disconnections of the integrators by the means that vary the order of the delta sigma modulator and the combination of plural integrators, and a table showing relations between the sampling frequencies and the optimum orders.

4. (original): A DA converter comprising a delta sigma modulator as claimed in any of Claim 1 through Claim 3.

5. (new): A variable-order delta sigma modulator comprising:
a plurality of integrators, each having an output coupled to a common delta sigma modulator output;
a plurality of quantization error circuits, each coupled to a respective output of an integrator and adapted to generate a quantization error;
a plurality of selectors coupled to receive the quantization error of an integrator and provided as an input to another integrator; and
means for detecting a sampling frequency and actuating selectors, wherein the order of the delta sigma modulator is controlled into an optimum order in relation to a sampling frequency.
6. (new): A variable-order delta sigma modulator as claimed in claim 5 comprising a control means for switching the order of the modulator into an optimum order on the basis of a new sampling frequency.
7. (new): A variable-order delta sigma modulator as claimed in claim 6, wherein said control means comprises at least one table identifying the switching state of the selectors and an optimum order and a sampling frequency.
8. (new): The variable-order delta sigma modulator as claimed in claim 7, comprising a first table showing connections or disconnections of the integrators on the basis of an order and a second table showing relations between the sampling frequencies and the optimum orders.
9. (new): A DA converter comprising a delta sigma modulator as claimed in any of claims 5-8.